Causes of Export Instability in Nepal

Abstract:

Heavy and sudden fluctuations in exports and price of exports creates the serious problems in balance of payments (BOP), national income, investment and then also creates the severe adverse impact on the overall growth of lessdeveloped countries. The severe consequences of export instability at the various front of the economy are ratchet effect on wages and manufactured products in the industrialized countries, especially during the period after boom, and the inflationary consequences on the least developed countries (LDCs) through the higher prices. In addition, all most all of the countries mostly failed to meet the minimum import requirements of target rate of growth and as a consequence, a persistent trade gap would generate, which reduce the economic growth. The will reduce investment and saving and finally deteriorate the situation of tax revenue.

In this context, most of the recent studies argued that instability in exports are related with commodity and geographic concentration index of exports, and gross domestic products (GDP) of the country. In addition to these, some other researchers argued that that export instability is also caused by growth rate of GDP. However, in this study we try to determine whether commodity and geographic concentration index of Nepalese exports and instability in agricultural and non-agricultural sector GDP cause export instability in Nepal by using the appropriate methodology as mentioned in this study.

1. Introduction

Violent and sudden fluctuations in prices, quantum and total amounts, of exports, according to traditional view, on the assumption that there exists an intimate relation between foreign trade, national income and investment, have a serious adverse impact on the overall growth of the less developed countries (LDCs), for the excessive fluctuations in prices and foreign exchange receipts, help generate fluctuations in domestics activities which in turn makes the process of planned development quite complicated and uncertain, reduce the efficiency with which investment resources are allocated and create manifold difficulties in estimating the expected return on investment which rises the cost of capital needed for greater risk (Aggarwal 1982). Policy makers and the academicians realized these views in most of the underdeveloped countries (UDCs) and they have been trying to stabilize their macroeconomic variables. However, there is a heavy fluctuation in foreign trade as well as in other macro economic variables of these countries. Nepal too is not free from these problems.

2. Definition of Export Instability

Simply the year to year fluctuation in exports figure is defined as export instability. Mathematically, it can be defined as the difference between the actual and estimated value of exports, expressing this difference as a percentage of average value of exports. According to The United Nations Secretariat in its 1952 study," Instability in Export Markets of Underdeveloped Countries", instability index is the absolute difference in the value of export from year to year, expressing this difference as a percentage of larger of the two annual values.

3. Causes of Exports Instability

It is generally agreed that, excessive fluctuations in foreign trade originate from variations in supply or demand or other economic and non-economic factors. But most of the recent studies based on statistical evidence conclude, though inclusively that instability index of exports are largely positively correlated with the degree of commodity concentration of exports and with the proportions of exports receipts obtained from the sales of primary goods and negatively correlated with per capita income and with the concentration of exports by geographical area of destination (David Murray, 1978).

Some empirical studies which are reviewed here for the purpose of study, such as those of Macbean (1966), Coppock (1962) and Voivodas (1973) questioned and even refute some of these views strongly and cast serious doubt about their general applicability both in the long and short run. Macbean, on the basis of a cross sectional study of 35 less developed countries, covering the period 1950 to 1958 and using Coppock's data, e.g., finds that there is no evidence of systematic significant association between:

i. The magnitude of fluctuations in national income and exports, and

ii. The growth rate of gross domestic product (GDP) and export instability, and

hence concludes that instability of exports, in general, is not deterimentional to the stability and the long run growth of LDCs. Macbean's findings are in close conformity with those obtained by Coppock who found an insignificant relation between the export instability index and the rate of growth of GNP.

Stern (1969) did a time series study in the context of Pakistan economy. Using data covering the year's 1957/58 to 1967/68, he regressed commodity concentration on instability index of exports, and found the coefficient of commodity concentration to be positive and statistically significant. The commodity as well as the geographic concentration index of exports is the Gini-Hirschman coefficient of concentration (Hirschman 1945) on exports. These can be calculated by using the formula given in the methodology of this study. Thus, this time series study at least supports the positive relationship between instability of export earning and commodity concentration. Paudyal (1988) by using the data from year 1956/57 to 1981/82 of Nepalese economy, attempt to analyzed export instability in Nepal in terms of export concentration by commodity and country of destination. In this study, he found the positive relationship between export instability and commodity and geographic concentration. However, due to the very low value of coefficient of determination, R^2=0.135, these variables cannot be considered as strong explanatory variables for instability index of export of Nepal.

4. Consequences of Export Instability:

The export instability of any country may create economic instability of the same country as well as other countries of the world because this world has been synchronizing by the process of globalization. In this regard, it is needed to give much attention to the effects of export instability on economic development. These issues have also been rising prominently in the UNCTAD Conference right from 1964 to present day, and as preliminary steps to counter the instability in LDC's exports

earnings, price stabilization agreement in primary products and a compensatory financing scheme to compensate the loss in LDC's earnings due to the deterioration in terms of trade of primary product vis-à-vis manufactured goods have been advocated. It is argued that fluctuating prices of primary product retard the process of economic growth and then to economic development in poor countries. It also triggers a ratchet effect on wages and manufactured products in the industrialized countries, especially during the period after boom, and the inflationary consequences would reverberate on to the LDC's through the higher prices, they must pay for their imports of investment and consumer goods.

Almost all of the countries frequently failed to meet the minimum import requirements of a target rate of growth and as a consequence, a persistent trade gap would severely constraint the process of economic development due to the sharp fluctuation in exports earning of these countries. This immediately affects certain types of capital goods which are essential for investment but not possible to produced domestically, and maintenance and replacement imports cannot be obtained in the required quantity. Even if it is possible to obtain in the required quantity, it will further deteriorate the foreign trade balance and then to the GDP of the country concerned. This, as Macbean (1969) argues, impose a brake on the growth of capacity as well as full capacity operation of existing plant, there by frustrating domestic saving.

The very high export instability always constrained the capacity of LDCs to plan and to make the investment programmes through its impact on domestic saving, tax revenue, and above all, their capacity to imports. According to Mac bean (1966) the export fluctuations may affect not only the peasants who produce exports crops but also the entrepreneurs who undertake investments in the production of manufactured goods. The peasants may not desire to afford the risk of depending on exportable crops which are subject to severe price instability, while the industrialist may find it difficult to estimate the expected returns on investment and be certain that the necessary capital goods and raw materials which need to be imported could be available. As a result incomes of exporters and industrialists who are likely to have a higher marginal propensity to save will fall, resulting in a fall in domestic savings.

5. Rationale of the Study:

During the period under study (1975 to 1998), exports with India were found to be highly fluctuating. It was Rs. 746.7 million in the year 1975. These amounts increased in the year 1976 and again decreased in the year, 1977 and 1978 which was only Rs. 498.1 million. This trend of increased and decreased was continued up to the year 1983. In the year 1984, it was highly increased to Rs. 1160.07 million. The annual growth rate of exports in this year was 37.6% which was very high. This trend continued in the remaining years also, however, the export was extremely decreased in the year 1990 which was only Rs. 602.5 million. Again, it was increased to Rs. 1552.2 million in the year 1991. In 1992, it was decreased and then increased continuously. This clearly indicates the heavy fluctuations in the exports to India. These figures of exports and export instability are shown in the Annex.

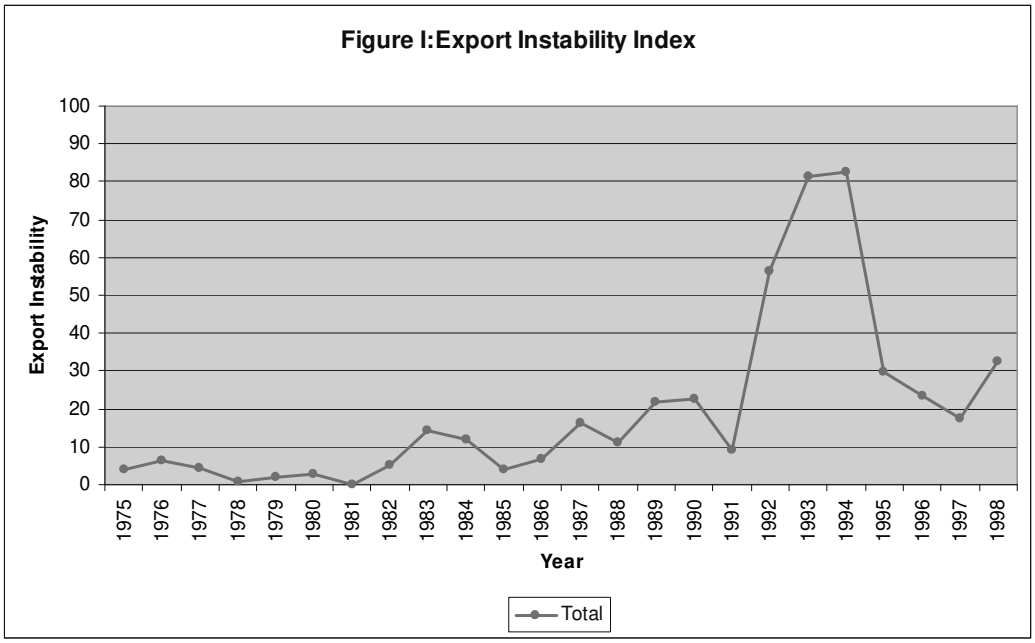
Instability in exports was also found in case of rest of the world countries (ROW). From the year 1975 to 1979, it was increased from Rs. 142.9 million to Rs. 646.7 Million. After this, it started to decrease and reached to Rs. 288.7 million in the year

1983. From the year 1984, it started to increase. These figures of exports and export instability are shown in the Annex.

This heavy fluctuation in the export figure to India and ROW countries causes heavy fluctuation in the total export from Nepal because total export is the sum of the export to India and ROW countries. The total trade figure and instability index in total export is shown in the Annex. In this scenario, we made an attempt to study the causes of export instability of Nepal in this paper.

Graphically, the scenario of instability index of total exports is shown in Figure. This figure will also clearly indicate the heavy fluctuation in export from Nepal. After the restoration of democracy in 1990, Nepal opted the free trade policy which causes to rise exports violently. As a result instability in export was also increased from 1991 to 1995. From 1995 onward due to the heavy export base the change was not much as that noted during 1991 to 1995.

In addition to this, even if there are various arguments and consequences of export instability, foreign grants and loans stabilize the balance of payment deficit of most of LDCs. Thus, even if there is greater instability in exports in most of the LDCs, it is not a severe economic problem. But if this inflow of foreign aid is reduced by any means, fluctuations in exports earning are likely to inflict



hardships on the economy. In this scenario, we consider the study of causes of exports instability is significant and essential. This study is, therefore, useful for the researchers, academicians and the policy makers.

6. Methodology:

6.1 Calculation of Concentration Index:

Most of the researchers' studies which are reviewed here for the purpose of study, such as those of Macbean (1966), Coppock (1962) and Voivodas (1973) considered commodity and geographic concentration index as the most important factors, which

influence the instability of exports. As defined already, the commodity and geographic concentration index of exports are calculated here by the Gini- Hirschman coefficient of concentration (1945). For the calculation of these coefficients these formulae are most widely in use all over the world.

To calculate the commodity and geographic concentration of foreign trade we use the following formula.

$$C_{xt} = 100\sqrt{\sum_{i=1}^{n}\left[\frac{X_{it}}{X_t}\right]^2}$$

Where,

C_{xt} = Concentration coefficient for exports in year t,
X_{it} = Value of exports of commodity group i in year t,
X_t = Total exports in year t.

and

$$G_{xt} = 100\sqrt{\sum_{i=1}^{n}\left[\frac{X_{it}}{X_t}\right]^2}$$

Where, G_{xt} = Index of geographic concentration in year t.

6.2 Measurement of Export Instability:

In the literature of economics, various statistical measures have been employed and proposed to calculate the instability index (II). Very simply we can calculate the II by calculating the "coefficient of variation". The coefficient of variation is calculated by using the formula:

$$V = \frac{\sigma}{\overline{X}}$$

Where, σ = standard deviation, and

$\overline{X} = \frac{\Sigma X}{N}$ = mean of the variable.

The next two methods, used by Massell (1964, 1970) and Kingston (1973,1976) are based on the deviations between the observed and estimated values obtained by fitting the linear and exponential trend lines with the help of ordinary least square (OLS) method. These are:

a. If linear trend is best fitted:

$$II = \left[\frac{\sum\left(X_t - \hat{X}_t\right)^2}{N}\right]^{1/2} \times 100$$

Where, X_t = Actual value of exports in the year t.

$\hat{X}_t$ = Estimated value of exports by using the linear trend method.

N = Number of observations.

b. If exponential trend is best fitted:

$$II = \left[\frac{\sum \left(X_t - \hat{X}_t \right)^2}{N} \right]^{1/2} \times 100$$

Where, X_t = Actual value of exports in the year t.

$\hat{X}_t$ = Estimated value of exports by using the exponential trend method.

N = Number of observations.

Macbean used another method to calculate II. He used a measure based on the deviations of actual value from the trend values obtained from a five-yearly moving average. The formula is:

$$\text{II} = \left[\sum_{t=3}^{N-2} \frac{\left(\left| X_t - MA_t \right| \right)}{MA_t} \right] \times \left(\frac{100}{N-4} \right)$$

Where, MA_t = Five-year moving average of X_t values centered on year t.

The United Nations Secretariat in its 1952 study "Instability in Export Markets of Under Developed Countries" used another method to measure instability. This method involves no formula adjustment for trend. It consists of obtaining the absolute difference in values from year to year, expressing this difference as a percentage of large of the two annual values and then averaging these percentages (Coppock, 1962). The formula for this method is:

$$II = \frac{ABS(X_{t+1} - X_t)}{X_t} \times 100, \quad \text{if } X_t > X_{t+1}.$$

and

$$II = \frac{ABS(X_{t+1} - X_t)}{X_{t+1}} \times 100, \quad \text{if } X_{t+1} > X_t.$$

Where, ABS = Absolute value,

X_{t+1} = Next year exports, and

X_t = Current year export.

Another measure given by Coppock known as long-variance index is defined as:

$$\text{II} = \left[(Anti \log) \sqrt{V \log} - 100 \right] \times 100$$

Where, $\text{Vlog} = \frac{1}{T-1} \sum \left(\log X_{t+1} - \log X_t - M \right)^2$

$$\text{M} = \frac{1}{T-1} \sum \left(\log X_{t+1} - \log X_t \right)$$

T = Numbers of years.

Each of these methods has its relative strengths and weaknesses. However, here we have tried to calculate the instability of exports by using the following formula. This formula is based on the average percentage deviation of the observed values of export

proceed from an exponential growth path (Paudyal 1988). In the following model we use the three distinct variables. These are actual value, mean of the actual value and the estimated trend value of exports figure.

Because the exponential trend is best fitted for the Nepalese data, II is calculated by using the formula

$$\text{II} = \left[\frac{X_t - \hat{X}_t}{\overline{\text{X}}} \right] \times 100$$

Where, $\hat{X}_t$ = Estimated trend value estimated by exponential trend

6.3 Causes of Export Instability:

To find the causes of export instability, here we develop the following functions.

$$II = f\left(C_x, G_x, II_{agdp}, II_{nagdp},\right)$$

Where,

C_x = Commodity concentration
II = Instability index
G_x = Geographic concentration
II_{agdp} = Instability index of agricultural GDP.
II_{nagdp} = Instability index of non-agricultural GDP.

In linear form, this model can be written as:

$$II = a + b_1 C_x + b_2 G_x + b_3 II_{agdp} + b_4 II_{nagdp} + U_t .$$

Other degenerated models are:

$$II = a + b_1 C_x + b_2 G_x + b_4 II_{nagdp} + U_t$$

In these models a, b_1, b_2, b_3, b_4, and b_5 are parameters. To estimate the value of these parameters, we use the OLS method of regression analysis by using SPSS 10.0 version of computer program.

In the above models to calculate II_{agdp} and II_{nagdp} we use the following formula:

$$\text{II}_{\text{agdp}} = \left[\frac{AGDP_t - \hat{AGDP}_t}{\overline{AGDP}} \right] \times 100$$

Where, $\hat{AGDP}_t$ = Estimated trend value estimated by exponential trend method.
AGDP_t = Actual value of AGDP in the year t.
$\overline{AGDP}$ = Mean of AGDP.

$$\text{II}_{\text{nagdp}} = \left[\frac{NAGDP_t - \hat{NAGDP}_t}{\overline{NAGDP}} \right] \times 100$$

Where, $\hat{NAGDP}_t$ = Estimated trend value estimated by exponential trend

method.

$NAGDP_t$ = Actual value of NAGDP in the year t.

$\overline{NAGDP}$ = Mean of NAGDP.

7. Empirical Evidence:

$$II_x = -102.685 + 1.129C_x + 0.84G_x + 0.631II_{agdp} + 1.414II_{nagdp}$$

t-value (-2.799) (2.405) (1.670) (0.649) (3.664)
t-sig. (0.011) (0.027) (0.111) (0.524) (0.002)
$R^2 = 0.779$ $R^2 = 0.732$ F- value = 16.718, F- sig. =0.000
D – W = 1.235 N = 24.

From the above model, it can be concluded that there is positive relationship between instability index of exports and the independent variables: C_x, G_x, II_{agdp}, and II_{nagdp}; each of these variables are specified above. The value of R^2, R^2 and F-sig. indicate that the independent variables are powerful to explain the instability index of exports of Nepal. However, t- value is found to be significant for the coefficient of C_x and II_{nagdp} and highly insignificant for the coefficient of IIagdp. But it is found to be significant at 11.1% significant level for the coefficient of G_x, which is not best significant. In addition to this, D-W value lies in the range of indecision. So, we cannot say whether there is autocorrelation or not. Highly significant F – ratio and insignificant t-ratio indicates some multicollenerity problem in this model. Therefore, we try to test the following degenerated model again.

$$II_x = -111.764 + 1.183C_x + 1.018G_x + 1.513II_{nagdp}$$

t-value (-3.345) (2.599) (2.419) (4.332)
t-sig. (0.003) (0.017) (0.025) (0.000)
$R^2 = 0.774$ $R^2 = 0.740$ F- value = 22.811, F- sig. =0.000
D – W = 1.392 N = 24.

In this model the value of R^2, R^2 and F- sig. (= 0.000) are approximately similar to the first model. In this model also, there is positive relationship between instability index of exports and independent variables: C_x, G_x and II_{nagdp}. In this case, t-values are also significant for each coefficient. In addition to this, D-W value lies in the range of indecision. So, we cannot say whether there is autocorrelation or not.

Thus from the study of the above two models, it can be concluded that C_x, G_x and II_{nagdp} are reasonable explanatory variables of the exports instability of Nepal.

There are other factors, which influence the exports of Nepal. These factors are:

1. No Product Specialization:

Nepal has no product specialization for its exports. Fore example, if we look at the major exportable commodity of Nepal, sometimes this country export rice while other time it export timber, jute and jute products. In some circumstances, it exports woolen products while in others it exports carpets, garments, pasmina shawl, etc. Due to this problem, total exports of Nepal fluctuate heavily.

2. **Supply Side Instability in Agricultural Product:**

   Due to the lack of product specialization, Nepal has no consistency on agricultural products for the purpose of exports. In addition to this, supply side instability is causes by the following reasons:

   i. Deterioration of natural resource, specially the forest resource by heavy deforestation. This causes to close the exports of timber from the year 1985.
   ii. The fluctuation in the production of raw jute, jute products for exports was fluctuated. Further, there were heavy fluctuations in the supply of Mustard and Linseeds, Pulses, Kutch, Live Animals, Flour, Ginger, Catechu, etc. This heavy fluctuation is due to the number ii causes or lack of product specialization for exports.
   iii. High degree of land fragmentation, lack of irrigation and climate based agricultural farming, and finally fastly increased population. Due to the first two reasons, i.e., high degree of land fragmentation, lack of irrigation and climate based agricultural farming land productivity is reduced and fluctuated. Due to the third one, i.e., fastly increased population, even if the land productivity was increased it was used to feed the increased population and as a result we were unable to increase supply of agricultural product for exports.

   These factors create heavy instability in exports of agricultural products, which have the significant share on the total export from Nepal.

3. **Inefficient Tax Administration and Long Open Boarder With India:**
   Due to the sluggish and prolonged bureaucratic procedure and kicked-backed (corrupt) nature of bureaucrats, the tax administration is highly inefficient. This causes to increase the unscrupulous trade practice. Further, we have approximately 800 Kilometers of long open boarder with India. This causes to encourage heavy illegal and unscrupulous trade practice in Nepal – India boarder. As a result export figures (noted from custom posts) from Nepal is found to be highly unstable.

4. **Policy Problems:**

   Various domestic as well as the major importer countries trade policies were also equally important to influence the exports from Nepal. The most important of them are listed below.

   a. **Quotas and Subsidies:** Some of the developed countries like USA, Germany and former European Union provide quotas and various types of subsidies to Nepali products in some fiscal years while they completely abolished these facilities in other years. This causes a heavy fluctuation in the exports of some major products and then to total exports.
   b. **Nepal – India Trade and Transit Treaty:** In some years of the study period, Nepal faced the problem of trade and transit with India, as for example from the year 1989 to 1991. During that period, India imposed heavy tariff on Nepalese products and as a result Nepalese

products could not compete with Indian products. This caused to reduce Nepalese exports.

c. Policy of His Majesty the Government of Nepal (HMG/N):

HMG/N adopted the various export promotion policies during this period. These policies were adopted for some years and broken for others due to their own lacunas. The major policies that were adopted for export promotion were:

1. Exporter's Exchange Entitlement scheme.
2. Dual Exchange Rate System.
3. Auction System.
4. Duty Draw-Back Facility.
5. Bonded Warehouse System.
6. Partial and then Full Convertibility of Current Account.

The last policy is still is practice. Each of these systems contributes significantly in the process of diversification of Nepal's exports of third countries. However, certain lacunas were felt in these systems. As a result, each one of these systems was decided to scrap one after another and replace it by another one.

These types of policy protections in some years reduce competency as well as quality of Nepalese exportable products in the one hand and also reduce exports in the years when these policy incentives are not provided in the other hand. Therefore, policies of HMG/N are also the causes of export instability in Nepal.

5. Lack of Exportable Quality:

Due to the lack of international exportable quality, Nepal's exports heavily fluctuated during the study period. If Nepalese entrepreneurs develop a new and better quality product it takes better international markets in the beginning. But after some years their quality will deteriorate due to the lack of quality control mechanism of the government and the private sectors. This immediately reduces the exports. Such type of phenomenon was observed in the export of pasmina shawl and woolen carpets.

8. Conclusions:

Like in most underdeveloped countries, foreign grants and loans also stabilize the BOP deficit of Nepal. But if this inflow of foreign aid is reduced by any means, fluctuations in export earning create hardship in the economy. In this regard, we try to find the causes of export instability in Nepal such that the policy makers can recommend appropriate policies to solve the problem of export instability and then BOP deficit.

From our study we can conclude that higher the commodity and geographic concentration of our exportable commodities and higher the instability in non-agricultural sector GDP, higher will be the exports instability. In addition to these factors, other causes of export instability in Nepal are outlined above.

Annex

Year	India		ROW Countries		Total	
	Exports	II	Exports	II	Exports	II
1975	746.7	13.399	142.9	0.438	889.6	3.807
1976	893.7	19.083	292.1	1.460	1185.8	6.337
1977	779.6	10.074	385.1	2.199	1164.7	4.394

1978	498.1	8.451	548.1	3.949	1046.2	0.862
1979	650.1	3.200	646.7	4.302	1296.8	1.901
1980	520.9	13.819	629.6	2.293	1150.5	2.748
1981	992.4	8.560	616.3	0.065	1608.7	0.175
1982	994.4	4.580	497.1	4.795	1491.5	5.120
1983	843.3	8.248	288.7	11.732	1132.0	14.300
1984	1160.7	4.504	543.2	11.356	1703.9	11.851
1985	1601.7	23.684	1138.9	5.995	2740.6	4.122
1986	1241.1	2.042	1836.9	0.077	3078.0	6.771
1987	1302.6	4.871	1688.8	10.519	2991.4	16.322
1988	1567.6	3.031	2546.9	5.238	4114.5	11.244
1989	1034.9	33.888	3160.4	6.617	4195.3	21.779
1990	602.5	65.897	4553.7	2.717	5156.2	22.638
1991	1552.2	21.990	5835.3	6.428	7387.5	8.985
1992	1450.0	37.171	12257.0	95.631	13707.0	56.265
1993	1621.7	38.005	15645.0	96.200	17267.0	81.465
1994	2408.9	5.627	16885.0	94.800	19293.0	82.350
1995	3124.3	21.778	14515.0	25.439	17639.0	29.638
1996	3682.6	39.394	16199.0	0.728	19881.0	23.398
1997	5226.2	110.46	17410.0	48.701	22637.0	17.649
1998	8794.4	292.49	18719.0	94.200	27514.0	32.684

Note: - *ROW refers to Rest of the World.*

Source: - *Quarterly Economic Bulletin, NRB, 1999.*

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